Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 112,1875 (2011)	30-Nov-2010

Q(β^-)=2610.13 *12*; S(n)=6443.39 *4*; S(p)=15015 *4*; Q(α)=−11857.5 *1* 2012Wa38
Note: Current evaluation has used the following Q record 2610.09 116443.39 *4* 15015 4 −11857.4912 2011AuZZ,2003Au03.

1999Wa21: Fragmentation of ^{50}Ti on ^{9}Be, E=330 MeV/u, at GSI; secondary beam of ^{27}Mg bombarded Pb and C targets; deduced excitation cross sections for the 1698 keV level of ^{27}Mg are 43(9) mb and 5.4(15) mb for Pb and C targets, respectively.

Nuclear effective root-mean-square (rms) radius measurement: 1998Su07.

^{27}Mg Levels

Cross Reference (XREF) Flags

A	^{27}Na β^- decay	D	^{26}Mg(n,γ) E=th
B	^{9}Be(^{28}Mg,^{27}Mgγ),^{9}Be(^{50}Ti,Xγ)	E	^{26}Mg(d,pγ)
C	^{25}Mg(t,p)	F	^{28}Si(μ^-,νpγ)

E(level)†	Jπ	$T_{1/2}$‡	XREF	Comments
0.0	1/2$^+$	9.458 min *12*	ABCDEF	%β^-=100 μ=−0.04107 *15* Jπ: L=0 in (d,p) and supported by μ=−0.04107 *15* (2008Ko05). $T_{1/2}$: weighted average of 9.51 min 3 (1953Da24), 9.39 min 3 (1953Lo09), 9.45 min (1953Sa11), 9.46 min 2 (1959Po64), 9.462 min 12 (1970Re13). μ: Laser and β^- Nuclear Magnetic Resonance (NMR) spectroscopy (2008Ko05).
984.88 *5*	3/2$^+$	0.97 ps *24*	ABCDEF	Jπ: L=2 in (d,p), 984.88γ M1+E2 to 1/2$^+$.
1698.52 *8*	5/2$^+$	0.81 ps *17*	ABCDEF	Jπ: L=2 in (d,p) and 1698.46γ E2 to 1/2$^+$.
1940.23 *6*	5/2$^+$	0.65 ps *14*	ABCDEF	Jπ: L=2 in (d,p), 955.4γ M1+E2 to 3/2$^+$, 1939.98γ to 1/2$^+$.
3109.73 *21*	(7/2$^+$)	71 fs *18*	A EF	Jπ: 1169.4γ M1+E2 to 5/2$^+$. From (d,p) and shell model calculation (1977Br07).
3427.4 *3*	(5/2$^+$,7/2$^+$)	69 fs *34*	A E	Jπ: 1728.9γ D+Q to 5/2$^+$, 2442.3γ to 3/2$^+$.
3476.34 *7*	1/2$^+$	<6.9 fs	BCDE	Jπ: L=0 in (d,p).
3491.34 *16*	3/2$^+$,5/2$^+$	<9.7 fs	A DE	Jπ: L=2 in (d,p).
3561.54 *4*	3/2$^-$	<7 fs	B DE	Jπ: L=1 in (d,p), 2576.5γ (E1) to 3/2$^+$.
3760.9 *6*	5/2$^-$,7/2$^-$	0.42 ps *7*	E	Jπ: L=3 in (d,p).
3787.27 *9*	3/2$^+$	<17 fs	DE	Jπ: L=2 in (d,p) and comparison with shell model calculation.
3884.6 *4*	(5/2$^+$,9/2$^+$)	>0.5 ps	E	Jπ: 1944γ to (3/2$^+$,7/2$^+$), 2186γ to 5/2$^+$. Level meanlife precluded pure quadrupole transition.
4150.4 *5*	(3/2$^+$,5/2$^+$)	<7 fs	A E	Jπ: L=2 in (d,p).
4398.8 *5*	(5/2$^+$,9/2$^+$)	45 fs *24*	E	Jπ: 2700γ to 5/2$^+$, 1288.8γ to (3/2$^+$,7/2$^+$), 971.3γ to (5/2$^+$,7/2$^+$). Level meanlife precluded pure quadrupole transition.
4553.3 *5*	(3/2$^+$,5/2$^+$)	<9 fs	A E	Jπ: L=2 in (d,p).
4776.6 *5*	(3/2,5/2,7/2)$^+$	<24 fs	A E	Jπ: γ-ray feeding to 5/2$^+$, (3/2$^+$,7/2$^+$), (5/2$^+$,7/2$^+$) states.
4828.17 *5*	1/2$^-$,3/2$^-$	<7 fs	B DE	Jπ: L=1 in (d,p).
4992.8 *5*	(5/2$^+$)	<7 fs	A E	Jπ: L=(2) in (d,p), feeding from ^{27}Na β^- decay (Jπ=5/2$^+$).
5028.84 *24*	1/2$^+$	<28 fs	DE	Jπ: L=0 in (d,p).
5172.6 *5*	(3/2,5/2)$^+$	<10 fs	C E	Jπ: L=2 in (d,p).
5296.8 *6*		<41 fs	C E	
5373.0 *5*	(5/2$^-$)	<16 fs	C E	Jπ: L=(3) in (d,p), 1813γ D+Q to 3/2$^-$, 4387γ to 3/2$^+$.
5412.6 *5*		<7 fs	C E	
5422.3 *10*	1/2$^-$,3/2$^-$	<7 fs	E	Jπ: L=1 in (d,p).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{27}Mg Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
5627.8 *4*	$(3/2,5/2)^+$	<7 fs	C E	Jπ: From L=2 in (d,p).
5749.7 *6*	5/2 to 9/2	<17 fs	C E	Jπ: γ-rays to $5/2^+$ and $(7/2^+)$.
5764.9 *10*	$(3/2,5/2)^+$	<17 fs	C E	Jπ: L=2 in (d,p).
5821.6 *5*	$(3/2,5/2)^+$	<7 fs	C E	Jπ: L=2 in (d,p).
5829.9 *8*		<82 fs	E	
5906 *7*	$(1/2,3/2)^-$		E	Jπ: L=1 in (d,p).
5925.81 *23*		34 fs *28*	CDE	
6009 *2*		<7 fs	C E	
6084 *2*			C E	
6125 *3*			C E	
6161 *2*			C E	
6312 *5*			C E	
6336 *3*			C E	
6380 *3*			E	
6508 *3*			C E	
6651 *3*			C E	
6721 *4*			C E	
6811 *3*			C E	
6859 *2*			C E	
6921 *3*			C E	
6991 *4*			C E	
7013 *5*			C E	
7147 *2*			E	
7278 *3*			E	
7505 *3*			E	
7530 *3*			E	
7690 *3*			E	
7700 *3*			E	
7859 *4*			E	
7927 *5*			E	
7976 *4*			E	

[†] Up to 5925 keV from a least-squares fit to γ-ray energies, ΔE=1 keV is assumed when not given. Many Adopted γ-rays depopulating up to 5925 keV level are experimental. Above this level, measured γ-ray energies were not available. Thus level energies quoted here are from (d,pγ). Please see comments in the γ-ray Table of the (d,pγ) dataset.

[‡] From (d,pγ).

γ(^{27}Mg)

E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Mult.[b]	δ[b]	Comments
984.88	$3/2^+$	984.88[‡] *8*	100	0.0	$1/2^+$	M1+E2	+0.22 *2*	B(M1)(W.u.)=0.023 *6*; B(E2)(W.u.)=6.0 *19*
1698.52	$5/2^+$	713.7[@]	<2.7[a]	984.88	$3/2^+$			
		1698.46[‡] *23*	100[a] *6*	0.0	$1/2^+$	E2		B(E2)(W.u.)=10.1 *23*
1940.23	$5/2^+$	241.6[@] *4*	12[a] *4*	1698.52	$5/2^+$			
		955.42[‡] *7*	100[a] *12*	984.88	$3/2^+$	M1+(E2)	−0.07 *6*	B(M1)(W.u.)=0.026 *7*; B(E2)(W.u.)=0.8 *+13−8*
		1939.98[‡] *10*	35[a] *8*	0.0	$1/2^+$			
3109.73	$(7/2^+)$	1169.40[#] *25*	100 *13*	1940.23	$5/2^+$	(M1+E2)	−0.23 *+19−6*	B(M1)(W.u.)=(0.18 *5*); B(E2)(W.u.)=(4.E+1 *+6−4*)
		1411.5	4 *3*	1698.52	$5/2^+$			
		2124.8	4 *3*	984.88	$3/2^+$			

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

γ(^{27}Mg) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Mult.[b]	δ[b]	Comments
3427.4	(5/2$^+$,7/2$^+$)	317.5	3.4 *17*	3109.73	(7/2$^+$)			
		1486.9	5 *3*	1940.23	5/2$^+$			
		1728.9[#] *5*	64 *9*	1698.52	5/2$^+$	D+(Q)	+0.05 *+3−8*	
		2442.3[#] *5*	100 *12*	984.88	3/2$^+$			
3476.34	1/2$^+$	1777.5	1.0 *10*	1698.52	5/2$^+$			
		2490.8	2.0 *10*	984.88	3/2$^+$			
		3476.19[@] *9*	100 *13*	0.0	1/2$^+$			
3491.34	3/2$^+$,5/2$^+$	1792.8[‡] *3*	30 *9*	1698.52	5/2$^+$			
		2506.1[‡] *7*	100 *18*	984.88	3/2$^+$			
		3490.8[‡] *5*	98 *36*	0.0	1/2$^+$			
3561.54	3/2$^-$	1862.93[@] *10*	2.00 *20*	1698.52	5/2$^+$			
		2576.50[@] *6*	6.5 *11*	984.88	3/2$^+$	(E1)		B(E1)(W.u.)>0.00038
		3561.31[@] *4*	100.0 *11*	0.0	1/2$^+$			
3760.9	5/2$^-$,7/2$^-$	2062.5	100	1698.52	5/2$^+$	D		
3787.27	3/2$^+$	676.5	6.3 *20*	3109.73	(7/2$^+$)			
		1846.95[@] *18*	33 *6*	1940.23	5/2$^+$			
		2088.66[@] *11*	65 *13*	1698.52	5/2$^+$			
		2801.3	4.0 *20*	984.88	3/2$^+$			
		3787.05[@] *15*	100 *13*	0.0	1/2$^+$			
3884.6	(5/2$^+$,9/2$^+$)	457	7 *4*	3427.4	(5/2$^+$,7/2$^+$)			
		775	7 *4*	3109.73	(7/2$^+$)			
		1944	100 *21*	1940.23	5/2$^+$			
		2186	8.6 *25*	1698.52	5/2$^+$			
4150.4	(3/2$^+$,5/2$^+$)	2209.8	28.6 *20*	1940.23	5/2$^+$	D+(Q)	−0.4 *+4−3*	
		2451.8	75.5 *20*	1698.52	5/2$^+$	D+Q	−0.23 *+5−2*	
		3165.2	100 *4*	984.88	3/2$^+$	D+Q	+0.16 *6*	
4398.8	(5/2$^+$,9/2$^+$)	514.2	15 *5*	3884.6	(5/2$^+$,9/2$^+$)			
		971.3	32 *7*	3427.4	(5/2$^+$,7/2$^+$)			
		1288.8	98 *15*	3109.73	(7/2$^+$)	D+Q	−0.13 *6*	
		2700.3	100 *15*	1698.52	5/2$^+$			
4553.3	(3/2$^+$,5/2$^+$)	1443.4	10 *4*	3109.73	(7/2$^+$)			
		2612.8	100 *19*	1940.23	5/2$^+$	D+Q	+0.42 *19*	
		2854.9	19 *8*	1698.52	5/2$^+$			
		3568.2	48 *13*	984.88	3/2$^+$			
		4552.8	15 *4*	0.0	1/2$^+$			
4776.6	(3/2,5/2,7/2)$^+$	892.1	48 *14*	3884.6	(5/2$^+$,9/2$^+$)			
		1349.2	14 *9*	3427.4	(5/2$^+$,7/2$^+$)			
		1666.7[#] *9*	66 *14*	3109.73	(7/2$^+$)			
		2836.1[#] *8*	100 *36*	1940.23	5/2$^+$			
4828.17	1/2$^-$,3/2$^-$	1266.65[@] *18*	11.1 *10*	3561.54	3/2$^-$			
		1336.80[@] *20*	5.4 *6*	3491.34	3/2$^+$,5/2$^+$			
		1351.86[@] *8*	10.5 *10*	3476.34	1/2$^+$			
		3843.01[@] *8*	100 *5*	984.88	3/2$^+$			
		4827.67[@] *6*	70 *4*	0.0	1/2$^+$			
4992.8	(5/2$^+$)	1231.9	10 *4*	3760.9	5/2$^-$,7/2$^-$			
		1565.4	8 *4*	3427.4	(5/2$^+$,7/2$^+$)			
		1882.9	13 *7*	3109.73	(7/2$^+$)			
		3052.3	8 *6*	1940.23	5/2$^+$			
		4007.6[#] *9*	100 *21*	984.88	3/2$^+$			
5028.84	1/2$^+$	1467.3[@] *5*	41 *13*	3561.54	3/2$^-$			

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

$\gamma(^{27}Mg)$ (continued)

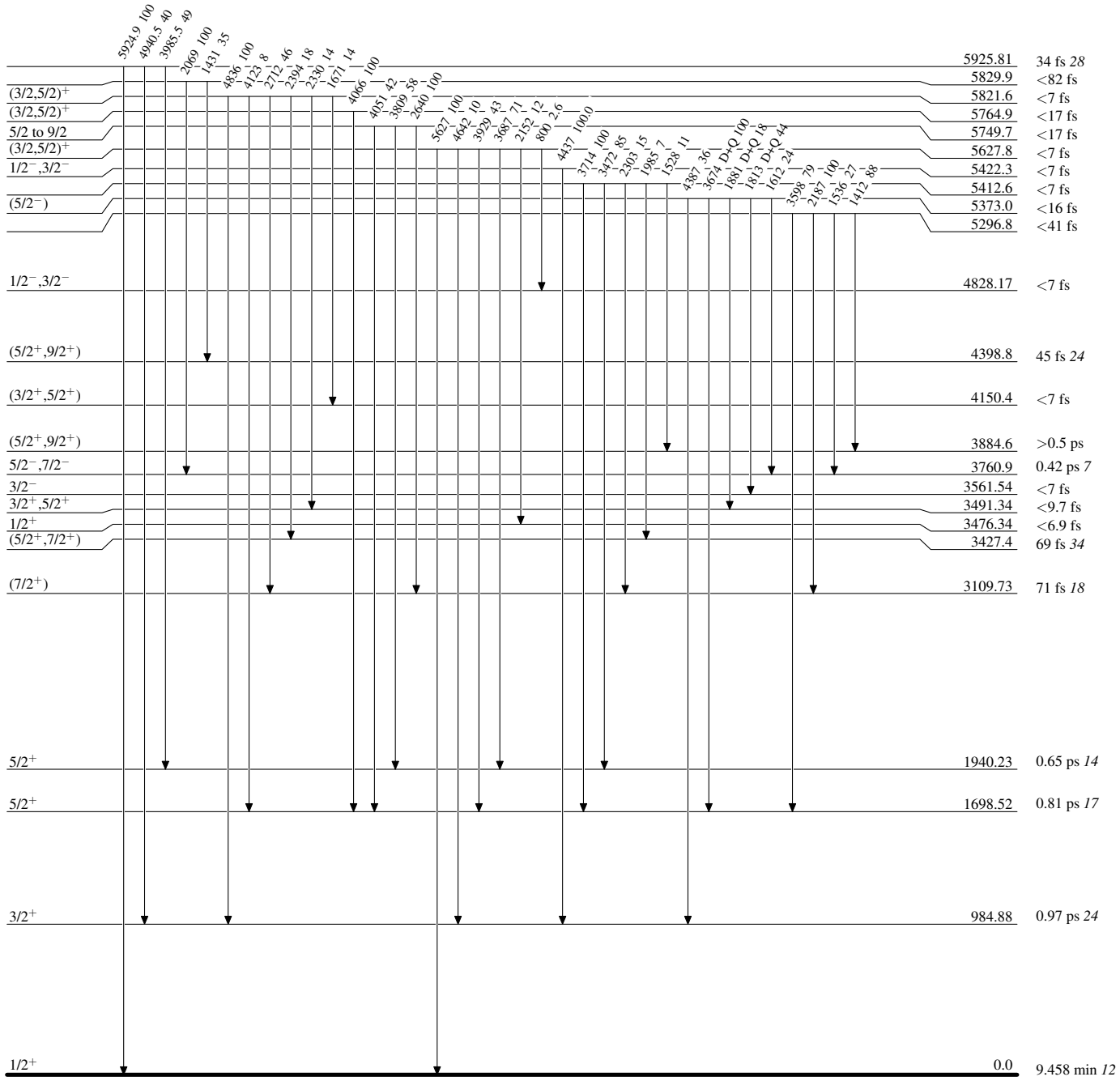
E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Mult.[b]	δ[b]
5028.84	1/2+	1537	14 *5*	3491.34	3/2+,5/2+		
		1552.8[@] *7*	23 *7*	3476.34	1/2+		
		4043.6[@] *3*	100 *21*	984.88	3/2+		
5172.6	(3/2,5/2)+	1022	11 *4*	4150.4	(3/2+,5/2+)		
		1386	22 *7*	3787.27	3/2+		
		3474	100 *20*	1698.52	5/2+		
		4187	38 *7*	984.88	3/2+		
		5172	51 *9*	0.0	1/2+		
5296.8		1412	88 *26*	3884.6	(5/2+,9/2+)		
		1536	27 *15*	3760.9	5/2−,7/2−		
		2187	100 *32*	3109.73	(7/2+)		
		3598	79 *29*	1698.52	5/2+		
5373.0	(5/2−)	1612	24 *9*	3760.9	5/2−,7/2−		
		1813	44 *11*	3561.54	3/2−	D+Q	+0.4 +*2−3*
		1881	18 *7*	3491.34	3/2+,5/2+	D+Q	+0.4 +*5−3*
		3674	100 *22*	1698.52	5/2+	D+Q	−0.6 +*5−3*
		4387	36 *13*	984.88	3/2+		
5412.6		1528	11 *7*	3884.6	(5/2+,9/2+)		
		1985	7 *4*	3427.4	(5/2+,7/2+)		
		2303	15 *4*	3109.73	(7/2+)		
		3472	85 *20*	1940.23	5/2+		
		3714	100 *24*	1698.52	5/2+		
5422.3	1/2−,3/2−	4437	100.0	984.88	3/2+		
5627.8	(3/2,5/2)+	800	2.6 *6*	4828.17	1/2−,3/2−		
		2152	12 *5*	3476.34	1/2+		
		3687	71 *17*	1940.23	5/2+		
		3929	43 *12*	1698.52	5/2+		
		4642	10 *5*	984.88	3/2+		
		5627	100 *14*	0.0	1/2+		
5749.7	5/2 to 9/2	2640	100 *26*	3109.73	(7/2+)		
		3809	58 *26*	1940.23	5/2+		
		4051	42 *14*	1698.52	5/2+		
5764.9	(3/2,5/2)+	4066	100	1698.52	5/2+		
5821.6	(3/2,5/2)+	1671	14 *4*	4150.4	(3/2+,5/2+)		
		2330	14 *6*	3491.34	3/2+,5/2+		
		2394	18 *8*	3427.4	(5/2+,7/2+)		
		2712	46 *8*	3109.73	(7/2+)		
		4123	8 *4*	1698.52	5/2+		
		4836	100 *14*	984.88	3/2+		
5829.9		1431	35 *16*	4398.8	(5/2+,9/2+)		
		2069	100 *31*	3760.9	5/2−,7/2−		
5925.81		3985.5[@] *6*	49 *11*	1940.23	5/2+		
		4940.5[@] *3*	40 *9*	984.88	3/2+		
		5924.9[@] *4*	100 *21*	0.0	1/2+		

[†] From (d,pγ), except otherwise noted.
[‡] Weighted average of data from ^{27}Na β^- decay and (n,γ).
[#] From ^{27}Na β^- decay.
[@] From (n,γ).
[&] Branching from (d,pγ) or (n,γ) (overall, the data from both reactions are in good agreement), except otherwise noted.
[a] From (n,γ).
[b] From (d,pγ).

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

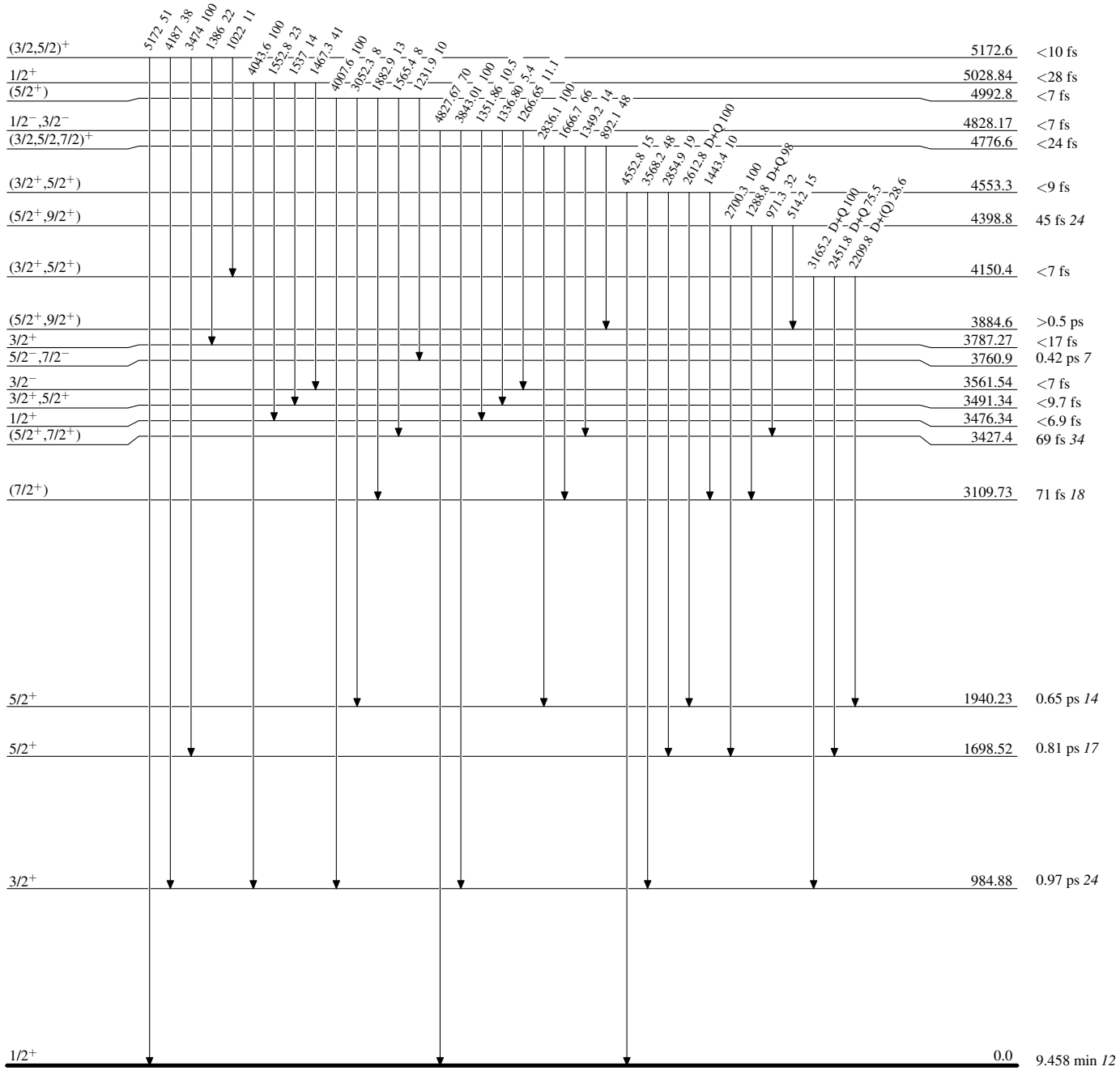


$^{27}_{12}Mg_{15}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

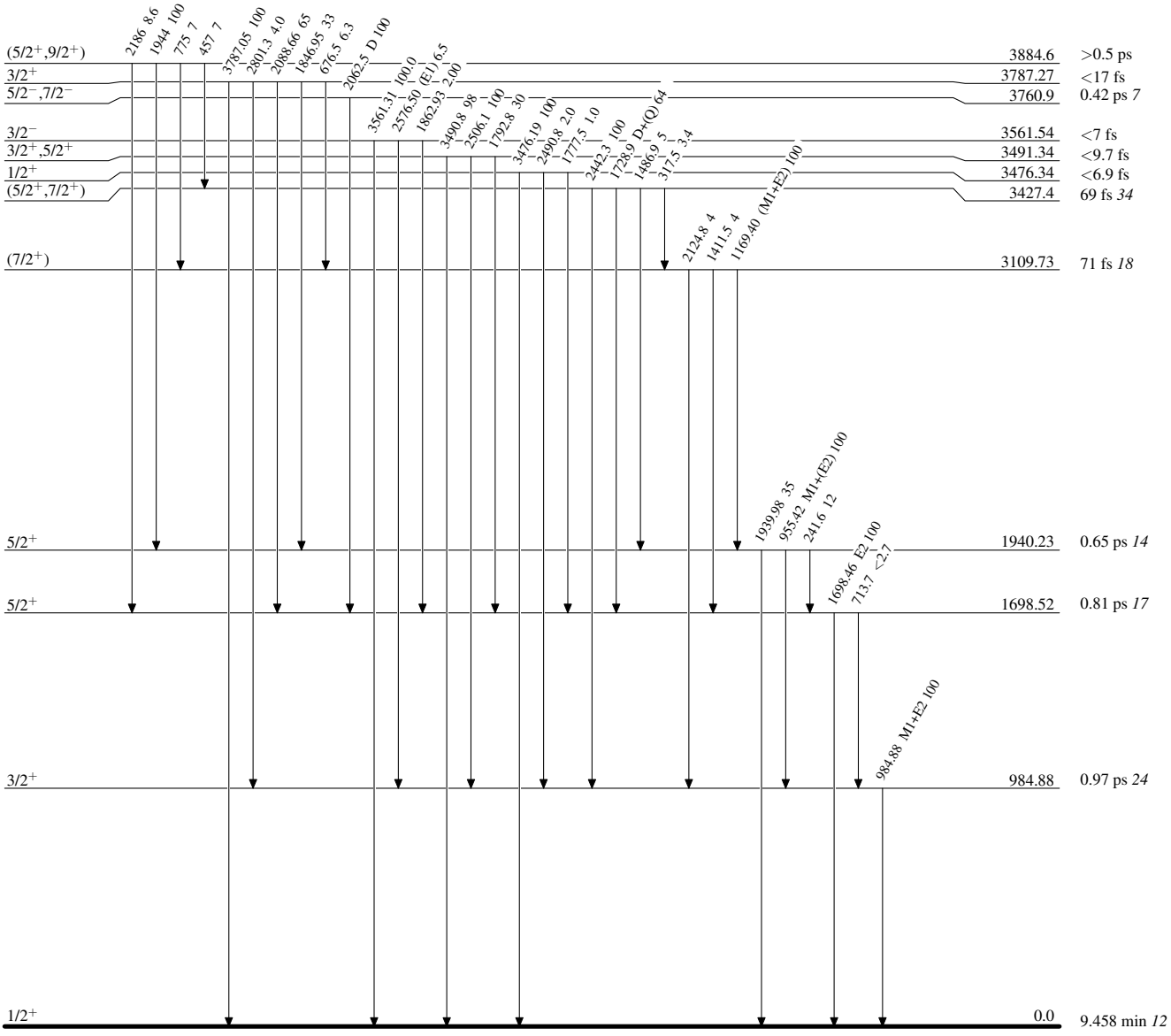


$^{27}_{12}Mg_{15}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{27}_{12}Mg_{15}$